

Sediment

VEGETATED WATERWAYS

Drains typically transport concentrated flows at potentially high velocities which increases the opportunity for soil movement especially when the drain is bare or has patchy vegetation.

Vegetated waterways are shallow, open channels primarily designed for conveying water in a longitudinal manner through a drainage pathway.

Diversion banks, contour banks and across-slope beds and mounds usually empty into a grassed waterway which transports runoff down the slope. Such waterways are often referred to as a 'drain' in the horticulture and vegetable industry.

Designed and managed appropriately they can remove coarse and medium sized particulate and are commonly combined with buffer strips, sediment basins and constructed wetlands to provide further treatment.

Where possible, waterways in cultivated paddocks should be located in natural drainage lines. Here, the slopes are usually lower than the adjacent land, and the topography tends to confine the flow to the waterway. However, there are many situations where there is no natural drainage line in a paddock. In these cases a straight waterway, often following a fence line, will usually be the best option.

In horticultural situations, constructed waterway channels are usually built below ground surface level to allow rows and drains to discharge into the channel. They need a flat bottomed or parabolic shaped channel, stabilised with species such as carpet grass or couch to carry runoff water safely down the slope. Care should be taken to avoid the use of herbicides that are capable of entering the runoff and killing this grass growth. Waterways should be stabilised with an adequate vegetative cover prior to rows, drains or banks being discharged into them.

Waterways should be designed so that they have sufficient capacity to contain the runoff that would be expected for the required design period (e.g. once in 10 years or greater if a higher level of protection is needed). Where grassed watercourses have no capacity to accommodate runoff, they are subject to serious erosion. Water always follows the least line of resistance and will not flow through grass unless it is confined in a sub-surface waterway or where banks are constructed on either side of the waterway.

A suitable height for vegetation in most waterways is around 30 cm. Slashing maintains the desired length of vegetation and reduces tall weed growth but it also aids in persistence and vigour of the grasses.

Waterways may fail by overtopping or by gully erosion in the bed of the waterway because they have to deal with concentrated flows. The following factors may contribute to waterway failure:

- High intensity rainfall may produce runoff that exceeds the design capacity of the waterway.
- The waterway may be too narrow or too shallow to handle the design runoff.
- The waterway may have the incorrect shape—V-shaped waterways are very susceptible to erosion.
- Lack of suitable vegetation in the waterway channel will lead to erosion.
- Tall waterway grasses may restrict flows, cause excessive siltation and lead to overtopping.
- A strip of grass along a drainage line is not likely to make an effective waterway. A properly constructed waterway with retaining banks is required to keep the run-off on the grassed area rather than flowing down the cultivation on either side.
- Ruts left by wheel tracks or cattle pads up and down a waterway will lead to failure by gullying.
- Waterways constructed into infertile and/or erodible subsoils are not likely to have good vegetation growth. Topsoil should be replaced after construction or the waterway should be built from the outside.

Information in this fact sheet has been obtained from the soil conservation manual work completed by Bruce Carey, retired Soil Conservation Officer, Queensland Department of Science, Information Technology, Innovation and the Arts (DSITIA), and is gratefully acknowledged.

Disclaimer: This information is provided as a reference tool only. Please seek professional advice.

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